The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A solid-state contactor for an arc welder, the contactor comprising:

a processor assembly being configured to generate a logical signal, the processor assembly including:

an output; and

a processor, the processor being configured to generate the logical signal at the output; and

a switch configured to conduct electrical current from a power source to a wire conductor in response to the logical signal at the output.

2. The contactor of Claim 1, the processor assembly further comprising an input in communication with the processor, the processor being configured to respond to the input.

3. The contactor of Claim 2, further comprising:

a current sensor in communication with the input, the current sensor being configured to sense the electrical current flowing from the power source to the wire conductor.

4. The contactor of Claim 2, further comprising:

a temperature sensor in communication with the input, the temperature sensor being configured to sense a temperature of the switch.

5. The contactor of Claim 2, further comprising:

a wire speed sensor in communication with the input, the wire feed sensor being configured to sense the temperature of the switch.

6. The contactor of Claim 1, wherein the switch is a transistor.

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7. The contactor of Claim 6, wherein the transistor is a field effect transistor.

8. The contactor of Claim 1, wherein the logical signal is received at the switch to pulse-width modulate the electrical current flowing from the power source to the wire conductor.

9. An arc welding machine including a solid-state contactor, the contactor comprising:

a power source, the power source being configured to provide an electrical current;

a processor assembly being configured to generate a logical signal, the processor assembly including:

an output; and

a processor, the processor being configured to generate the logical signal at the output; and

a switch configured to conduct electrical current from the power source to a wire conductor in response to the logical signal at the output.

10. The welding machine of Claim 9, the processor assembly further comprising an input in communication with the processor, the processor being configured to respond to the input.

11. The welding machine of Claim 10, further comprising:

a current sensor in communication with the input, the current sensor being configured to sense the electrical current flowing from the power source to the wire conductor.

12. The welding machine of Claim 10, further comprising:

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a temperature sensor in communication with the input, the temperature sensor being configured to sense a temperature of the switch.

13. The welding machine of Claim 10, further comprising:

a wire speed sensor in communication with the input, the wire feed sensor being configured to sense the temperature of the switch.

14. The welding machine of Claim 9, wherein the switch is a transistor.

15. The welding machine of Claim 14, wherein the transistor is a field effect transistor.

16. The welding machine of Claim 9, wherein the logical signal is received at the switch to pulse-width modulate the electrical current flowing from the power source to the wire conductor.

17. A method for welding with an arc welding wire feed machine, the method comprising:

conducting an electrical current from a power source to a drain of at least one transistor; and

energizing a gate of the at least one transistor, the transistor configured to admit an electrical current from the power source to a wire conductor in response to energizing the gate.

18. The method of Claim 17, further comprising:

monitoring a magnitude of the electric current;

comparing the magnitude to a reference value; and

de-energizing the gate when the magnitude exceeds the reference value.

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19. The method of Claim 18, further comprising:

re-energizing the gate when the magnitude is less than the reference value.

20. The method of Claim 17, further comprising:

monitoring a magnitude of a temperature of the at least one transistor;

comparing the magnitude to a reference value; and

de-energizing the gate when the magnitude exceeds the reference value.

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